

**HAZARD RANKING SYSTEM (HRS)  
DOCUMENTATION RECORD – REVIEW COVER SHEET**

**Name of Site:** Fruit Avenue Plume

**Site Spill Identifier No.:** 06DD

**Contact Person**

**Documentation Record:** EPA Region 6 (214) 665-7436  
Superfund Site Assessment Section (6SF-RA)  
Brenda Nixon-Cook  
National Priorities List (NPL) Coordinator

**Pathways, Components, or Threats Not Evaluated**

Surface Water Pathway: The surface water pathway has not been scored because there is no overland segment or flood potential for this site. Further, there is no ground water to surface water component for the site (Ref. 1, Sec. 2.2.3).

Soil Exposure: No contaminated soils or other areas of observed contamination associated with the ground water plume have been identified. Based on the available information, evaluation of this pathway would not significantly affect the overall site score (Ref. 1, Sec. 2.2.3).

Air Pathway: An observed release to the air migration pathway has not been documented because there are no analytical data to support a release. Based on available information, evaluation of the air migration pathway would not significantly affect the overall site score (Ref. 1, Sec. 2.2.3).

**FRUIT AVENUE PLUME  
Albuquerque, New Mexico**

The Fruit Avenue Plume site consists of a plume of trichloroethylene-contaminated ground water in the aquifer underlying downtown Albuquerque, Bernalillo County, New Mexico. Despite extensive efforts by the New Mexico Environment Department (NMED) over the past 9 years, the source of the ground water contamination has yet to be identified.

In April 1989, contamination was detected in a Coca-Cola Bottling Plant well during routine compliance sampling by the City of Albuquerque Environmental Health Department (CAEHD). Trichloroethylene (TCE) was detected at a level of 14.5 micrograms per liter ( $\mu\text{g/l}$ ), 9.5  $\mu\text{g/l}$  above the maximum contaminant level (MCL) of trichloroethylene in drinking water of 5  $\mu\text{g/l}$ . Subsequent sampling of the well in July 1989 indicated the presence of TCE at 13.1  $\mu\text{g/l}$ . Based on these results and a recommendation from CAEHD, the Coca-Cola Bottling Company discontinued use of the well in July 1989.

In response to the discovery of TCE contamination, NMED initiated a Preliminary Assessment in December 1989 of the area surrounding the Coca-Cola Bottling Plant well. NMED identified five potential sources of the ground water contamination in the downtown Albuquerque area. Subsequent investigations were conducted from 1990 to 1998 to identify the source of the contamination and assess ground water conditions. These investigations included collection and analysis of subsurface soil samples, installation of ground water monitoring wells, and collection and analysis of ground water samples. TCE and a related substance, tetrachloroethylene (PCE), were detected in numerous ground water samples within the area of the plume. Though potential sources of contamination were identified during these investigations, the information collected to date has not been adequate to directly attribute the contamination to one or more of these sources.

In the absence of a specific source of contamination, the Fruit Avenue Plume site has been identified as a plume of contaminated ground water that includes 14 monitoring wells and a closed, private water supply well at which significant levels of contamination have been detected. These 15 wells are located approximately 2 miles east of the Rio Grande River in downtown Albuquerque. The area is approximately bounded by Fruit Avenue to the north, Elm Street to the east, Tijeras/Martin Luther King Avenue to the south, and 4<sup>th</sup> Street to the west. The 15 wells are located in the Santa Fe Group aquifer, which includes hydraulically connected alluvial fan deposits and valley alluvium in the Albuquerque area. The maximum concentration of TCE detected within the plume to date is 76  $\mu\text{g/l}$ , more than 15 times the 5  $\mu\text{g/l}$  MCL. The maximum concentration of PCE detected within the plume is 15  $\mu\text{g/l}$ , 10  $\mu\text{g/l}$  above the MCL for PCE of 5  $\mu\text{g/l}$ .

The City of Albuquerque relies on water withdrawn from the Santa Fe Group aquifer for its sole source of drinking water. New Mexico and the Albuquerque Basin have long histories of imbalance between water needs and availability. The climate is such that naturally occurring surface water supplies are not dependable. As such, ground water is the primary source of water for urban, rural, commercial, and industrial uses in the Albuquerque Basin. Albuquerque operates 88 ground water supply wells providing drinking water to more than 400,000 individuals. Thirty-six of these wells are completed in the Santa Fe Group aquifer within 4 miles of the site. An active private well is also completed in the aquifer within this distance. Combined, public and private wells within 4 miles of the site supply the needs of close to 200,000 individuals. Contamination has not been detected in these wells to date.

*[The description of the site (release) is based on information available at the time the site was scored. The description may change as additional information is gathered on the sources and extent of contamination. See 56 FR 5600, February 11, 1991, or subsequent FR notices.]*

## HRS DOCUMENTATION RECORD

**Name of Site:** Fruit Avenue Plume

**Site Spill Identifier No.:** 06DD

**CERCLIS Site ID No.:** NMD986668911

**EPA Region:** 6

**Date Prepared:** 1 March 1999

**County and State:** Bernalillo County, New Mexico

**General Location within the State:** The site is located in the City of Albuquerque located in central New Mexico, approximately 60 miles southwest of the City of Santa Fe. The following USGS 7.5-minute topographic maps were used in locating the site: Albuquerque East, NM (1990); Albuquerque West, NM (1990); and Los Griegos, NM (1990) (Ref. 3).

**Latitude:** 35°05' 11.2" North

**Longitude:** 106°38' 26.2" West

|                       | <u>Scores</u> |
|-----------------------|---------------|
| Air Pathway           | Not scored    |
| Ground Water Pathway  | 100           |
| Soil Exposure Pathway | Not scored    |
| Soil Exposure Pathway | Not scored    |

**HRS SITE SCORE:** 50

## NOTES TO THE READER

1. For the purposes of this HRS documentation record, a plume of contaminated ground water has been identified in Albuquerque, Bernalillo County, New Mexico. The boundary of the plume is defined by ground water samples meeting observed release criteria. The precise extent of the plume has not yet been identified. Based on currently available information, it is not certain whether there is one plume or several plumes. As such, only one plume has been considered for this documentation record since the contaminants detected in the wells were the same. Several potential sources of contamination have been identified in the immediate area due to their proximity to the ground water plume and the presence of the same contaminants as those identified in the plume. However, adequate information is not available to directly attribute contamination detected at these facilities with the ground water plume. Therefore, the site has been scored based on a contaminated ground water plume with no source identified.
2. The following rules were applied when citing references in this documentation record:
  - A. Tracking numbers are assigned by the region to every page of every reference. The tracking number consists of the reference number followed by the page number within that reference. A tracking number has a two-digit number followed by the sequential number (e.g., 040001, 040002).
  - B. If the reference has an original page number, that page number was cited.
  - C. If the reference cited has no original page number or the pagination is not complete, then the designated tracking number was cited.
  - D. Analytical data are referenced by tracking numbers only.
3. Hazardous substances are listed by the names used in the June 1996 Superfund Chemical Data Matrix (SCDM) (Ref. 2). It should be noted that trichloroethene is commonly referred to as TCE and tetrachloroethene is also known as perchloroethylene or PCE. These distinctions have been made because some reports and analytical data from previous investigations refer to these substances in this manner.
4. Data qualifiers assigned by the Houston EPA Environmental Services Assistance Team (ESAT) data review team may vary from those assigned by the Contract Laboratory Program (CLP) laboratory on the Form I data sheets.
5. Attachment A of this documentation record consists of the following:
  - Attachment A—Figures

Figure A-1—Source Location Map

Figure A-2–Source Area Map  
Figure A-3–Well Location Map

- Attachment B–Data Quality Assessment

## SITE SUMMARY

The Fruit Avenue Plume Site is an unidentified ground water plume site located in Albuquerque, Bernalillo County, New Mexico. The boundary of the plume is defined by samples from 15 groundwater wells meeting observed release criteria. The precise extent of the plume has not yet been identified. As such, only one plume has been considered for the purposes of this documentation record since the contaminants in the wells are the same. Several potential sources of contamination have been identified in the immediate area due to their proximity to the ground water plume and the presence of the same contaminants as those identified in the plume. However, adequate information is not available to directly attribute contamination detected at these facilities with the ground water plume. Therefore, the site has been scored based on a contaminated ground water plume with no source identified.

The Fruit Avenue Plume site is located in downtown Albuquerque, Bernalillo County, New Mexico (Ref. 3, 1). The area in which the ground water plume has been identified is urban in setting and primarily occupied by buildings and asphalt or concrete (Ref. 4, p. 2). In April 1989, trichloroethene contamination was discovered in the Coca-Cola Bottling Plant well during routine compliance sampling by the City of Albuquerque Environmental Health Department (CAEHD) (Ref. 4, p. 6).

Analytical results of the ground water sample reported trichloroethene at 14.5 micrograms per liter ( $\mu\text{g/L}$ ) and cis-1,2-dichloroethene at 7  $\mu\text{g/L}$  (Ref. 6, pp. 1, 8). Subsequential sampling of the well in July 1989 reported trichloroethene at 13.1  $\mu\text{g/L}$ , cis-1,2-dichloroethene at 2.4  $\mu\text{g/L}$ , and trans-1,2-dichloroethene at 1.2  $\mu\text{g/L}$  (Ref. 6, pp. 2, 11). The concentrations of trichloroethene detected in both samples exceeded its health-based benchmark (MCL) of 5  $\mu\text{g/L}$  (Ref. 2). Due to the presence of the trichloroethene contamination, the Coca-Cola Bottling Company ceased use of its well in July 1989 at the recommendation of CAEHD (Ref. 4, p. 6; Ref. 7, pp. 1-2).

Due to the discovery of the contamination in the Coca-Cola Bottling Plant well, the CAEHD and the New Mexico Environment Department (NMED) initiated investigations in an effort to determine a source of the contamination. The CAEHD conducted the removal of two underground storage tanks (USTs) from a dry-cleaning facility in the downtown area in November 1989. The contents of the two USTs were not determined. Subsurface soil samples collected from the excavation pit after the removal of the tanks reported tetrachloroethene at a maximum concentration of 3,000 milligrams per kilogram (mg/kg) and trichloroethene at a maximum concentration of 500 mg/kg (Ref. 4, p. 6; Ref. 6, pp. 3-4, 10).

NMED performed a Preliminary Assessment (PA) in an effort to determine the source of the ground water contamination in the Coca-Cola Bottling Plant well in December 1989. The PA report identified a total of five potential sources within the vicinity of the Coca-Cola Bottling Plant well (Ref. 4, pp. 6-7).

NMED performed a Screening Site Inspection (SSI) in October 1990. Field activities conducted during the SSI included the installation of four ground water monitoring wells (MW-1 through MW-4) at the former dry cleaning facility where the USTs had been removed (Ref. 8, pp. 5, 8, 30).

NMED performed an Expanded Site Inspection (ESI) in February through August of 1993. Field activities conducted during the ESI included the installation of three ground water monitoring wells (MW-5 through MW-7) and the collection of additional ground water and subsurface soil samples (Ref. 9, p. 39). Two monitoring wells displayed concentrations of trichloroethene that equaled or exceeded its MCL (Ref. 2; Ref. 9, pp. 6, 12-13, 27).

Dames and Moore performed a Phase II Environmental Site Assessment, from August through October 1993, of the area in which the former dry-cleaning facility was located (Ref. 10, p. 1). This area is currently an asphalt parking lot (Ref. 10, p. 4). The investigation consisted of a historical site review, sampling of existing wells, and the installation of seven soil borings and sixteen monitoring wells. The newly installed monitoring wells were also sampled (Ref. 10, p. 1). One ground water sample displayed a concentration of tetrachloroethene that exceeded its MCL. Five ground water samples displayed concentrations of trichloroethene that exceeded its MCL (Ref. 10, p. 41).

NMED performed a comprehensive ground water sampling event in 1996 (Ref. 5, pp. 2-51). Ground water samples were collected from 23 existing monitoring wells in the downtown Albuquerque area in order to assess the current ground water conditions of the area prior to performing a Background Investigation. Concentrations of trichloroethene were detected in 17 of the 23 monitoring wells sampled (Ref. 4, pp. 1,9).

NMED performed a Background Investigation, in two phases, from September 1997 through August 1998. The first phase of the Background Investigation was conducted from September through November 1997 and included the installation of 6 soil borings, installation and sampling of 19 new monitoring wells (MW-8 through MW-26), and sampling of 49 existing monitoring wells. The Coca Cola Bottling Plant commercial production well was also sampled during this phase (Ref. 4, p. 1). Two ground water samples collected displayed concentrations of tetrachloroethene that exceeded its MCL. Sixteen ground water samples collected displayed concentrations of trichloroethene that exceeded its MCL.

The second phase of the Background Investigation was conducted from April through August 1998 and included aquifer testing, installation and sampling of 11 new monitoring wells (MW-27 through MW-37), and sampling of 16 existing monitoring wells. The American Linen and Saint Joseph's Hospital private supply wells were also sampled during this phase (Ref. 4, p. 2). Three ground water samples collected displayed concentrations of trichloroethene that exceeded its MCL.

## WORKSHEET FOR COMPUTING HRS SITE SCORE

|  | <u>S</u> | <u>S<sup>2</sup></u> |
|--|----------|----------------------|
| 1. Ground Water Migration Pathway Score (S <sub>gw</sub> )<br>(from Table 3-1, line 13)                                  | 100      | 10,000               |
| 2a. Surface Water Overland/Flood Migration Component<br>(from Table 4-1, line 30)  | NS       | NS                   |
| 2b. Ground Water to Surface Water Migration Component<br>(from Table 4-25, line 28)                                      | NS       | NS                   |
| 2c. Surface Water Migration Pathway Score (S <sub>sw</sub> )<br>Enter the larger of lines 2a or 2b as the pathway score. | NS       | NS                   |
| 3. Soil Exposure Pathway Score (S <sub>s</sub> )<br>(from Table 5-1, line 22)  | NS       | NS                   |
| 4. Air Migration Pathway Score (S <sub>a</sub> )<br>(from Table 6-1, line 12)  | NS       | NS                   |
| 5. Total of $S_{gw}^2 + S_{sw}^2 + S_s^2 + S_a^2$  | ----     | 10,000               |
| 6. HRS Site Score: Divide the value on line 5 by 4<br>and take the square root.  | ----     | 50                   |

### Notes:

S      Score  
 S<sup>2</sup>    Score squared  
 NS     Not Scored

Tables 3-1, 4-1, 4-25, 5-1, and 6-1 refer to scoresheets presented in the HRS Rule (Reference 1). Table 3-1 is reproduced on the following pages of this documentation record for the convenience of the reader.

**SITE NAME: FRUIT AVENUE PLUME SITE**

**SITE SCORE: 50**

**TABLE 3-1<sup>d</sup>**  
**GROUND WATER MIGRATION PATHWAY SCORESHEET**

**FACTOR CATEGORIES AND FACTORS**

| <b>LIKELIHOOD OF RELEASE TO AN AQUIFER</b> |   | <b>MAXIMUM<br/>VALUE</b> | <b>VALUE<br/>ASSIGNED</b> |
|--|---|--------------------------|---------------------------|
| 1.   | Observed Release                                    | 550                      | 550                       |
| 2.   | Potential to Release                                |                          |                           |
|  | 2a. Containment                                     | 10                       | NS                        |
|  | 2b. Net Precipitation                               | 10                       | NS                        |
|  | 2c. Depth to Aquifer                                | 5                        | NS                        |
|  | 2d. Travel Time                                     | 35                       | NS                        |
|  | 2e. Potential to Release [lines 2a x (2b +2c + 2d)] | 500                      | NS                        |
| 3.   | Likelihood of Release (higher of lines 1 or 2e)     | 550                      | 550                       |

**WASTE CHARACTERISTICS**

|    |                          |     |     |
|----|--------------------------|-----|-----|
| 4. | Toxicity/Mobility        | a   | 100 |
| 5. | Hazardous Waste Quantity | a   | 100 |
| 6. | Waste Characteristics    | 100 | 10  |

**TARGETS**

|    |                                    |    |       |
|----|------------------------------------|----|-------|
| 7. | Nearest Well Value                 | 50 | 45    |
| 8. | Population                         |    |       |
|    | 8a. Level I Concentrations         | b  | 0     |
|    | 8b. Level II Concentrations        | b  | 1,741 |
|    | 8c. Potential Contamination        | b  | 3,478 |
|    | 8d. Population (lines 8a +8b + 8c) | b  | 5,219 |

**SITE NAME: FRUIT AVENUE PLUME SITE**

**SITE SCORE: 50**

**TABLE 3-1 <sup>d</sup>**  
**GROUND WATER MIGRATION PATHWAY SCORESHEET**  
**(Continued)**

**FACTOR CATEGORIES AND FACTORS**

**GROUND WATER MIGRATION SCORE FOR AN AQUIFER**

|     |   |     |       |
|-----|---|-----|-------|
| 9.  | Resources                                 | 5   | 0     |
| 10. | Wellhead Protection Area                  | 20  | 5     |
| 11. | Targets (lines 7 + 8d + 9 + 10)           | b   | 5,269 |
| 12. | Aquifer Score (lines 3 x 6 x 11/82,500) c | 100 | 100   |

**GROUND WATER MIGRATION PATHWAY SCORE**

|     |   |     |     |
|-----|---|-----|-----|
| 13. | Ground Water Pathway Score (Sgw)<br>(highest value from line 12 for all aquifers evaluated) c | 100 | 100 |
|-----|---|-----|-----|

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Notes:

- NS Not Scored.
- a Maximum value applies to waste characteristics category.
- b Maximum value not applicable.
- c Do not round to the nearest integer.
- d Table 3-1 refers to scoresheets presented in the HRS Rule (Reference 1).

## REFERENCES

1. 40 CFR Part 300, Hazard Ranking System; Final Rule, 14 December 1990. Volume 55, No. 241.
2. U.S. Environmental Protection Agency (EPA). 1996. Superfund Chemical Data Matrix (SCDM). June 1996.
3. U.S. Geological Survey (USGS). 1990. Albuquerque East, Albuquerque West, and Los Griegos, New Mexico (7.5-minute topographic series maps). Total Pages: 3.
4. New Mexico Environment Department (NMED). 1999. Background Investigation Report for the Fruit Avenue Plume Site, Albuquerque, New Mexico. 10 February 1999. Total Pages: 71.
5. NMED. 1996 through 1998. Field Logbook Notes for the Fruit Avenue Plume Site, Albuquerque, New Mexico. 07 November 1996 through 10 November 1998. Total Pages: 403.
6. Scientific Laboratory Division (SLD). 1989 and 1995. Analytical Reports for Samples OR-89-0483, OR-89-0998, and OR-89-1746 and associated Quality Assurance/Quality Control Reports. December 1989 and October 1995. Total Pages: 14.
7. City of Albuquerque Environmental Health Department (CAEHD). 1989. Letter to Mr. Charles Russell, President of the Coca Cola Bottling Company advising the plant to cease use of its commercial/production well. 25 July 1989. Total Pages: 2.
8. NMED. 1990. Site Screening Inspection (SSI) Report for the Fruit Avenue Plume Site, Albuquerque, New Mexico. 15 October 1990. Total Pages: 37.
9. NMED. 1994. Expanded Site Inspection (ESI) Report for the Fruit Avenue Plume Site, Albuquerque, New Mexico. 21 September 1994. Total Pages: 46.
10. Dames and Moore. 1994. Phase II Investigation Report for the Albuquerque Industrial Center, Albuquerque, New Mexico. 24 January 1994. Total Pages: 189.
11. United States Environmental Protection Agency (USEPA). 1992. Hazard Ranking System Guidance Manual; Interim Final. November 1992. Total Pages: 3.
12. USEPA. 1997. Contract Laboratory Program (CLP) Analytical Reports for Sample Designation Group (SDG) # FQ874, Case # 25839. 9 December 1997. Total Pages: 94.
13. USEPA. 1993. CLP Analytical Reports for SDG # FQ924, Case # 20004. 22 June 1993. Total Pages: 34.

14. USEPA. 1997. CLP Analytical Reports for SDG # FQ811, Case # 25815. 5 December 1997. Total Pages: 42.
15. USEPA. 1996. *Using Qualified Data to Document an Observed Release*. November 1996. Total Pages: 15.
16. New Mexico Bureau of Mines and Minerals. 1992. Open File Report # 387: *Hydrogeologic Framework of the Northern Albuquerque Basin*. September 1992. Total Pages: 13.
17. U.S. Geological Survey. 1993. Water Resources Investigations Report 93-4149: *Geohydrologic Framework and Hydrologic Conditions in the Albuquerque Basin, Central New Mexico*. 1993. Total Pages: 114.
18. United States Army Corps of Engineers. 1979. Albuquerque Greater Urban Area: Urban Studies Program. Albuquerque, New Mexico. September 1979. Total Pages: 9.
19. SLD. 1990. Analytical Reports for Samples OR-90-0814, OR-90-0812, and OR-90-0809 and associated QA/QC Reports. 2 July 1990. Total Pages: 6.
20. USEPA. 1993. CLP Analytical Reports for SDG # FX009, Case # 20690. 30 September 1993. Total Pages: 39.
21. SLD. 1993 - 1995. Analytical Reports for Saint Joseph Hospital well samples and associated QA/QC Reports. September 1990 through December 1996. Total Pages: 80.
22. USEPA. 1997. CLP Analytical Reports for SDG # FFH84, Case # 25207. 24 January 1997. Total Pages: 64.
23. USEPA. 1997. CLP Analytical Reports for SDG # FW501, Case # 25198. 4 February 1997. Total Pages: 34.
24. USEPA. 1997. CLP Analytical Reports for SDG # FQ893, Case # 25851. 22 December 1997. Total Pages: 23.
25. USEPA. 1997. CLP Analytical Reports for SDG # FQ839, Case # 25815. 3 December 1997. Total Pages: 30.
26. USEPA. 1997. CLP Analytical Reports for SDG # FQ809, Case # 25815. 3 December 1997. Total Pages: 32.
27. USEPA. 1998. CLP Analytical Reports for SDG # FQ714, Case # 26381. 27 August 1998. Total Pages: 30.

28. USEPA. 1997. CLP Analytical Reports for SDG # FFP71, Case # 25613. 2 September 1997. Total Pages: 26.
29. USEPA. 1998. CLP Analytical Reports for SDG # FR839, Case # 26194. 25 June 1998. Total Pages: 24.
30. Johnson, A. WESTON. 1999. Record of Communication with Stan Franklin, Director of Plant Operations, Saint Joseph's Hospital, regarding the use of their well. 11 January 1999. Total Pages: 1.
31. New Mexico State Engineer Office. 1962. Well Record for the University of New Mexico # 5 well. 1962. Total Pages: 2.
32. Brown, R. 1995. Record of Communication with Frank McQuiry, Water Systems Technician, University of New Mexico, regarding the University's water system. 12 October 1995. Total Pages: 1.
33. NMED. 1995. Letter to Mr. Richard Peck, President, University of New Mexico, regarding ground water contamination in the UNM # 5 well. 13 December 1995. Total Pages: 2.
34. SLD. 1999. Analytical Report for Sample OR-9900051. 13 January 1999. Total Pages: 2.
35. SLD. 1995. Analytical Report for Sample OR-95-3283. 1 August 1995. Total Pages: 1.
36. Menetrey, M. NMED. 1994. Record of Communication with Cindy Paulson, Human Resources Department, Saint Joseph's Hospital, regarding the population of the hospital. 31 May 1994. Total Pages: 1.
37. Johnson, A. WESTON. 1999. Record of Communication with Bart Farris, NMED, regarding the University of New Mexico wells. 18 February 1999. Total Pages: 1.
38. City of Albuquerque. 1999. Letter to Aimee Johnson, WESTON, regarding municipal well locations and population served for Albuquerque, New Mexico; City of Albuquerque Municipal Water System Map. 13 January 1999. Total Pages: 5.
39. Johnson, A. WESTON. 1999. Record of Communication with Brad Hoff, Manager, Coca Cola Bottling Plant, regarding their former production well. 12 January 1999. Total Pages: 1.
40. NMED. 1990. Wellhead Protection Program for the State of New Mexico. August 1990. Total Pages: 6.

41. City of Albuquerque Public Works Department, Water Utility Division. 1998. Analytical Report for the Duranes # 1 well. 4 August 1998. Total Pages: 6.
42. Johnson, A. WESTON. 1999. Record of Communication with Birgit Landin, New Mexico Environmental Department, regarding ground water samples collected for various Fruit Avenue investigations. 14 July 1999. Total Pages: 1.
43. USEPA. Not Dated. Version OLC02.0. Target Compound List and Contract Required Quantitation Limits. Total Pages: 6.

## SOURCE DESCRIPTION

### 2.2 SOURCE CHARACTERIZATION

#### 2.2.1 Source Identification

- Number of the source: 1
- Name and description of the source: Ground Water Plume with no identified source(s).

This source consists of a plume of contaminated ground water and will be classified and evaluated as the HRS source type "Other" (ground water plume) (Ref. 11, p. 42). The following information provides rationale for classifying the source as a ground water plume. The source is considered to be a contaminated ground water plume because extensive soil and ground water investigations have been unsuccessful in completely identifying the source(s) of contamination (Ref. 11, p. 42). The ground water plume is characterized as the site and source based on the fact that the plume was established solely by sampling using the criteria for an observed release to the ground water migration pathway (Ref. 1, Secs. 2.3 and 3.1.1).

The boundary of the source is defined by ground water samples from the following 15 wells meeting observed release criteria: DM-2, DM-3, DM-4, DM-5, DM-12, DM-13, MW-6, MW-18, MW-22, MW-23, MW-25, MW-26, MW-27, MW-28, and the Saint Joseph's Hospital well.

- Location of the source with reference to a map of the site:

The 14 monitoring wells and 1 private supply well meeting observed release criteria and used to delineate the estimated boundary of the contaminated ground water plume are located approximately 2 miles east of the Rio Grande River within the downtown area of Albuquerque. The approximate boundary of the plume is bounded by Fruit Avenue to the north, by the Saint Joseph's hospital to the east, by Tijeras/Martin Luther King Jr. Avenue to the south, and by 4th Street to the west as shown on Figure A-3 of Attachment A.

- Source type for HRS evaluation purposes:

This source consists of a plume of contaminated ground water and will be classified and evaluated as the HRS source type "Other" (ground water plume).

- Containment:

**Gas release to air:** The air migration pathway was not evaluated; therefore, gas containment was not evaluated.

**Particulate release to air:** The air migration pathway was not evaluated; therefore, particulate containment was not evaluated.

**Release to ground water:** Evidence of migration from the source to the ground water pathway has been documented; therefore, a containment value of 10 is assigned to the source (Ref. 1, Table 3-2). No containment features are associate with this source as it is a ground water plume

**Release by overland flood migration and/or flood:** The surface water migration pathway was not evaluated; therefore, surface water containment was not evaluated.

## 2.2.2 Hazardous Substances Associated with a Source

Because this site has been scored as a ground water plume, all CERCLA-eligible substances meeting observed release criteria, regardless of attribution, have been considered. As such, the maximum concentration of each of the CERCLA-eligible substances detected in ground water has been used to characterize the ground water plume (Ref. 1, Sec. 2.3). Presented in the table below are the highest concentrations of each constituent detected in the ground water plume that meet the observed release criteria set forth in Section 2.3 of the HRS Rule (Ref. 1, Sec. 2.3, Table 2-3).

An observed release to an aquifer is established by demonstrating that the site has released a hazardous substance to the aquifer (Ref. 1, Sec. 3.1.1). Observed release criteria are met when the sample measurement is three times or more above the background concentration and above the sample quantitation limit (SQL). If the hazardous substance is not detected in the background sample, an observed release is established when the sample measurement equals or exceeds the SQL for samples analyzed through the EPA CLP, and the detection limit for non-CLP samples (Ref. 1, Sec. 2.3, Table 2-3). Well locations are depicted on Figure A-3 of Attachment A. Observed release tables are presented in Section 3.1.1 of this documentation record. Development of background is also presented in Section 3.1.1 of this documentation record.

**TABLE I**  
**HAZARDOUS SUBSTANCES ASSOCIATED WITH A SOURCE**

| WELL ID/SAMPLE ID | DATE SAMPLED | HAZARDOUS SUBSTANCE | CONCENTRATION (SQL) (µg/L) | REFERENCES   |
|-------------------|--------------|---------------------|----------------------------|--|
| DM-4/FQ877        | 11/12/97     | Tetrachloroethene   | 15 (1)                     | Ref. 5, p. 270; Ref. 12, pp. 1-16, 19, 31; Ref. 42, p.2. |
| DM-13/FQ879       | 11/12/97     | Trichloroethene     | 76 (1)                     | Ref. 5, p. 271; Ref. 12, pp. 1-16, 19, 35; Ref. 42, p.2. |

Note:

DM Dames and Moore

## 2.2.3 Identify Hazardous Substances Available to a Pathway

The site is being scored as a ground water plume, and the following hazardous substances have been documented to be present in the plume at concentrations significantly above designated background levels: trichloroethene and tetrachloroethene.

## **2.4.2      Hazardous Waste Quantity**

### **2.4.2.1      Source Hazardous Waste Quantity**

#### **2.4.2.1.1      Hazardous Constituent Quantity - Not Calculated**

The information available is not sufficient to evaluate Tier A; therefore, it is not possible to adequately determine a hazardous constituent quantity (Tier A) for Source 1, Ground Water Plume (Ref. 1, Subsec. 2.4.2.1.1). As a result, the evaluation of hazardous waste quantity proceeds to the evaluation of Tier B, hazardous wastestream quantity (Ref. 1, Subsec. 2.4.2.1.2).

#### **2.4.2.1.2      Hazardous Wastestream Quantity - Not Calculated**

The information available is not sufficient to evaluate Tier B; therefore, it is not possible to adequately determine a hazardous wastestream quantity (Tier B) for Source 1, Ground Water Plume (Ref. 1, Subsec. 2.4.2.1.2). As a result, the evaluation of hazardous wastestream quantity proceeds to the evaluation of Tier C, volume (Ref. 1, Subsec. 2.4.2.1.3).

#### **2.4.2.1.3      Volume**

The vertical and areal extent of the ground water plume cannot be adequately determined. Therefore, it is not possible to adequately determine a volume in cubic yards for this source. The volume of contamination will be assigned a volume hazardous waste quantity value of greater than ( $>$ ) 0 (Ref. 1, Subsec. 2.4.2.1.3).

Volume of Source (yds<sup>3</sup>):  $C > 0$   
Volume Assigned Value:  $> 0$ , but unknown

#### **2.4.2.1.4      Area - Not Evaluated**

Area was not evaluated because a volume for the source has been calculated.

#### **2.4.2.1.5      Source Hazardous Waste Quantity Value**

According to the HRS Rule, the highest of the values assigned to the source for hazardous constituent quantity (Tier A), hazardous wastestream quantity (Tier B), volume (Tier C), and area (Tier D) should be assigned as the source hazardous waste quantity value (Ref. 1, Subsec. 2.4.2.1.5). As such, the assigned source hazardous waste quantity value is greater than 0, but unknown.

Source Hazardous Waste Quantity Value:  $> 0$ , but unknown

# SITE SUMMARY OF SOURCE CONTAINMENT

| SOURCE | SOURCE<br>HAZARDOUS<br>WASTE QUANTITY | GROUND<br>WATER | SURFACE<br>WATER | GAS | AIR<br>PARTICULATE |
|--------|---------------------------------------|-----------------|------------------|-----|--------------------|
| 1      | >0, but unknown                       | 10              | NE               | NE  | NE                 |

NE Not Evaluated

According to the HRS Rule, for all pathways (except soil exposure), if the source hazardous waste quantity value cannot be determined and is known to be greater than 0, and if Level I and/or Level II targets are present for the pathways being evaluated; then a value of 100 is assigned as the hazardous waste quantity for that pathway (Ref. 1, Subsec. 2.4.2.2). As such, a hazardous waste quantity factor value of 100 is assigned for the ground water pathway (Ref. 1, Subsec. 2.4.2.2).

Hazardous Waste Quantity Factor Value: 100

## POTENTIAL SOURCES

NMED performed a Background Investigation in September 1997 through August 1998. The objectives of this investigation were to determine a possible source of the ground water contamination, delineate the estimated lateral and vertical extent of the ground water contamination, and determine whether the ground water contamination present in the downtown Albuquerque area could potentially affect existing municipal supply wells (Ref. 4, p. 1).

Potential sources identified consisted of dry-cleaning facilities, UST sites, auto body repair shops, and a chemical warehouse (Ref. 4, pp. 8, 10). Available records and information concerning the facilities were evaluated with respect to solvent/chemical usage and disposal practices, past and present, that would aid in the release of hazardous substances. Further, various subsurface soil samples and ground water samples were collected during the various investigations performed in an attempt to characterize soil and ground water conditions at each potential source (Ref. 4, pp. 12-15).

The large number of potential sources makes source identification difficult. Further, adequate information to attribute hazardous substances from these potential sources directly to the ground water plume is not available. Therefore, the contaminated ground water will be classified and evaluated as HRS source type "Other" (ground water plume) (Ref. 11, p. 42). For further details regarding these potential sources, NMED's Background Investigation Report has been provided as Reference 4. Per HRS Rule, Section 3.1.1, when the source itself consists of a ground water plume with no identified source(s), no separate attribution is required (Ref. 1, Sec. 3.1.1).

### **3.0            GROUND WATER MIGRATION PATHWAY**

#### **3.0.1        General Considerations**

##### **Regional Geology**

The Fruit Avenue Plume site is located in the central portion of New Mexico, within the Albuquerque Basin. The Albuquerque Basin is in the northern part of the Basin and Range physiographic province (Ref. 16, p. 5). Low topographic relief characterizes much of the area within the basin. Basin width varies from about 10 miles in the north to about 40 miles in the central basin area (Ref. 16, p. 5). Rocks in the Albuquerque Basin are primarily continental sediments interbedded with minor volcanic rocks and are classified as the Santa Fe Group deposits (Ref. 16, p. 6).

The Santa Fe Group deposits consist of poorly sorted, weakly stratified sand and conglomerate commonly with a silt-clay matrix (Ref. 16, p. 7). Thickness of the Santa Fe Group ranges from less than 2,400 to greater than 3,000 feet along the margins of the basin to 14,000 feet in the central part of the basin (Ref. 17, p. 49).

Unconsolidated alluvium of Recent-age overlies the rocks of the Santa Fe Group along the floodplain of the Rio Grande and its tributaries. The alluvium consists mainly of thinly bedded clay, silt, sand, and fine gravel. The alluvium is very similar to the Santa Fe Group from which the materials are largely derived and reworked. Thickness of alluvium along the Rio Grande is 100 to 200 feet (Ref. 18, p. 3).

##### **Regional Hydrogeology**

An aquifer is defined as one or more strata of rock or sediment that is saturated and sufficiently permeable to yield economically significant quantities of water to wells or springs. An aquifer includes any geologic material that is currently used or could be used as a source of water (for drinking or other purposes) within the Target Distance Limit (TDL) (Ref. 11, p. 116). As such, the Santa Fe Group Aquifer is an HRS-eligible aquifer and will be used to score the Fruit Avenue Plume Site.

New Mexico and the Albuquerque Basin have had long histories of imbalance between water needs and availability. The climate in New Mexico is such that naturally occurring surface water supplies are not dependable (Ref. 17, p. 4).

Ground water is the primary source of water for urban, rural, commercial, and industrial uses in the Albuquerque Basin (Ref. 17, p. 53). The alluvium and the Santa Fe Group deposits are two distinct aquifers, but act as a single hydraulic unit (Ref. 18, p. 3).

The primary water-yielding zones are within the upper part of the Santa Fe Group, to a lesser degree the middle part of the Santa Fe Group, and valley and basin-fill deposits (Ref. 17, p. 30). Permeability of the

Santa Fe Group is generally high except in localized areas of fine-grained sediments or cementation along fault zones. Wells constructed in the Santa Fe Group Aquifer generally yield from several hundred to several thousand gallons per minute (gpm) (Ref. 18, p. 2).

The major contribution to the ground water system of the Albuquerque Basin is mountain-front and tributary recharge. Most mountain-front recharge occurs along the eastern boundary of the Albuquerque Basin. Ground water also flows into the Albuquerque Basin from the Española and San Juan Basins to the northeast and northwest, respectively (Ref. 17, p. 85).

Most of the City of Albuquerque's production (public supply) wells are located on the east side of the Rio Grande and west of the eastern extent of the ancestral river axial channel deposits (Ref. 17, p. 49). The water table in the Albuquerque area slopes generally southward at a gradient equal to that of the Rio Grande (Ref. 18, p. 3). Depth to the water table was generally less than eight feet in 1960. However, water level measurements from 1978 indicated that significant changes have occurred in the configuration of the water table since 1960 (Ref. 18, p. 9).

### Site Geology

The Fruit Avenue Plume site is immediately underlain by unconsolidated alluvium of Recent-age, which consists mainly of thinly bedded clay, silt, sand, and fine gravel (Ref. 18, p. 3). The Santa Fe Group deposits underlie the alluvium. The Santa Fe Group and alluvium are two distinct aquifers that act as a single hydrologic unit because they are hydraulically connected (Ref. 4, p. 16).

During the Dames and Moore 1994 investigation, ground water was encountered at depths of approximately 32 to 45 feet below ground surface (bgs) (Ref. 10, p. 16). During NMED's 1999 Background Investigation, ground water was encountered at depths from 35 feet to 38 feet bgs (Ref. 4, p. 17). The water table configuration in the Albuquerque area has changed considerably over time due to the population growth and the resulting increased water pumpage and use. Presently, ground water within the vicinity of the plume flows to the east (Ref. 4, p. 16). City-wide ground water contours from 1992 reflect a large cone of depression developing on the east side of Albuquerque as a result of ground water withdrawal (Ref. 4, p. 17).

Prior to the expansion of the City of Albuquerque municipal water supply system in the late 1950's, many of the municipal wells were screened into the upper, post-Santa Fe Group deposits. Currently, water for most municipal and industrial supply wells is obtained from the deeper Santa Fe Group deposits (Ref. 4, p. 16). The aquifer beneath the City of Albuquerque is the sole source of drinking water supply for the city and the surrounding areas (Ref. 4, p. 17). Ground water in this region is heavily relied upon and is an extremely valuable resource (Ref. 4, p. 17).

### 3.1 **LIKELIHOOD OF RELEASE**

#### 3.1.1 **Observed Release**

The ground water pathway is the only pathway being evaluated for the Fruit Avenue Plume site due to the nature of the contamination (i.e., ground water plume). (Ref. 1, Sec. 2.2.3). Identification and characterization of the ground water plume was based on ground water sampling results from seven different investigations. An observed release to the Ground Water Pathway per HRS Rule, Section 3.1.1 has been established based on these results (Ref. 1, Sec. 2.3). Information used to evaluate the ground water migration pathway is presented in the subsections below.

The Santa Fe Group Aquifer is the aquifer being evaluated. The Santa Fe Group and alluvium are interconnected hydraulically and together constitute the principle aquifer or ground water reservoir in the Albuquerque area (Ref. 18, p. 3). As such, the Santa Fe Group deposits and alluvium will be considered a single hydrologic unit for HRS scoring purposes.

**Direct Observation:** Not Applicable

#### **Chemical Analysis:**

#### **Background Wells**

Ground water samples used to establish designated background levels for substances in the vicinity of the Fruit Avenue Plume site were based on analytical results from the following investigations: (1) extensive ground water sampling performed by NMED in 1996; (2) September 1997 through August 1998 Background Investigation performed by NMED and (3) various routine sampling events for the Saint Joseph's Hospital well conducted from 1993 through 1998 (Ref. 4; Ref. 9). Wells designated as background wells have been depicted on Figure A-3 of Attachment A; the Duranes #1 well is depicted on the City of Albuquerque municipal water system map included in Reference 38.

Ground water flow within the vicinity of the site is generally towards the east (Ref. 4, p. 28). Thus, groundwater wells designated as background wells were chosen based on their location being upgradient or cross-gradient from the approximate location of the identified source (ground water plume) as shown on Figure A-3 of Attachment A (Ref. 3, p. 1). The background well samples were collected from the same aquifer (Santa Fe Group) as the release well samples.

The aquifer in which the City of Albuquerque draws its water supply, the Santa Fe Group Aquifer, is known to be interconnected and having no regional confining layers separating the alluvium from the Santa Fe Group deposits (Ref. 18, p. 3). Thus, a background well having a screened interval similar to that of a release well will be considered comparable for HRS purposes.

Screened intervals of background wells range from 25 to 964 feet below ground surface (bgs) (Ref. 4, pp. 70-71). Based on the analytical laboratory data, the samples collected from the designated background wells were collected and analyzed in the same manner (i.e., collected using the same sampling techniques and analyzed under the same analytical methods) as those samples collected from the release wells. Background samples were compared to release samples based on sample collection date and screened interval. Each release sample was compared to the most appropriate background sample for that particular event (i.e., alluvium to alluvium, etc.). Further, the Saint Joseph's Hospital well was used as its own background well since contamination by trichloroethene had not been previously detected in the well.

It should be noted that the Duranes # 1 well has been included as a background well for comparability purposes at depth. The Duranes # 1 well is a City of Albuquerque municipal supply well screened from 204 to 964 feet bgs and located within a 1-mile radius northwest of the estimated center of the plume (Ref. 41, pp. 2, 6). Ground water quality data for the Duranes # 1 well was provided by the City of Albuquerque. Concentrations of the contaminants of concern were not detected above the Sample Quantitation Limit (SQL) (Ref. 41, pp. 3-6).

**TABLE II**  
**GROUND WATER BACKGROUND SAMPLE RESULTS**

| SAMPLE LOCATION          | SJH   | DM-8I  | MW-9I  | MW-11S   | DURANES #1                           | MW-14D   |
|--------------------------|---|--|--|--|--------------------------------------|--|
| SAMPLE ID                | OR-93-2954  | FW878  | FQ867  | FQ888  | -----                                | FQ887  |
| DATE SAMPLED             | 11/18/93  | 12/09/96   | 11/06/97   | 11/13/97   | 08/04/98                             | 11/13/97   |
| DEPTH (FT)               | 438   | 103  | 77.8   | 40.3   | 964                                  | 166.3  |
| SCREENED INTERVAL (FT)   | †   | 70-103   | 67.6-77.6  | 25-40  | 204-964                              | 156-166  |
| Hazardous Substance      | Concentration (SQL)                                     |  |  |  |                                      |  |
| Trichloroethene (µg/L)   | 0.9 (1)   | 0.5 J* (1)   | 0.8 J* (1)   | ND (1)   | ND (0.5)                             | ND (1)   |
| Tetrachloroethene (µg/L) | NA  | ND (1)   | ND (1)   | ND (1)   | ND (0.5)                             | ND (1)   |
| References               | Ref. 4, p. 46;<br>Ref. 21, pp.<br>1-5; Ref. 42,<br>p.2. | Ref. 4,<br>p.69; Ref.<br>5, p. 10;<br>Ref. 22, pp.<br>1-4, 7, 26;<br>Ref. 42, p.2. | Ref. 4, p. 70;<br>Ref. 5, p. 266;<br>Ref. 14, pp. 1-6,<br>9, 19, Ref. 42, p.<br>2. | Ref. 4, p. 70;<br>Ref. 5, p.275;<br>Ref. 12, pp.<br>1-16, 21; Ref.<br>42, p.2. | Ref. 41, pp. 2 - 6;<br>Ref. 42, p.2. | Ref. 4, p. 70;<br>Ref. 5, p. 274;<br>Ref. 12, pp. 1-<br>16, 21, 55; Ref.<br>42, p.2. |

Notes:

NA Not analyzed.

J Estimated value.

† The Saint Joseph Hospital well is screened at four different intervals: 260-270; 280-300; 334-354; and 410-420 (Ref. 4, p. 46).

\* It should be noted that the estimated concentrations of trichloroethene (0.5 J and 0.8 J) reported in monitoring wells DM-8I and MW-9I were not adjusted according to guidance outlined in the EPA guidance document: "Using Qualified Data to Document an Observed Release" because the initial concentrations were below the constituents' respective SQL (Ref. 15, pp. 1-3).

### **Additional Sampling Information**

In April 1989, trichloroethene contamination was discovered in the Coca-Cola Bottling Plant well during routine compliance sampling by the City of Albuquerque Environmental Health Department (CAEHD) (Ref. 4, p. 6). Subsequential sampling of the well in July 1989 confirmed the presence of trichloroethene greater than the health-based benchmark (Ref. 6, pp. 2, 11). Due to the presence of the trichloroethene contamination, the Coca-Cola Bottling Company ceased use of its well in July 1989 at the recommendation of the CAEHD (Ref. 4, p. 6; Ref. 7, pp. 1-2).

NMED performed an SSI in October 1990. Field activities conducted during the SSI included the installation of four ground water monitoring wells at the former dry cleaning facility where the USTs had been removed (Ref. 8, pp. 5, 8, 30). NMED also performed an ESI in February through August of 1993. Three new ground water monitoring wells were installed and ground water and subsurface soil samples were collected (Ref. 9, p. 39). Two monitoring wells displayed concentrations of trichloroethene that equaled or exceeded its benchmark (Ref. 2; Ref. 9, pp. 6, 12-13, 27).

Dames and Moore performed a Phase II Environmental Site Assessment, from August through October 1993, of the area in which the former dry cleaning facility was located (Ref. 10, p. 1). Existing ground water wells were sampled and sixteen new monitoring wells were installed. One ground water sample displayed a concentration of tetrachloroethene that exceeded its benchmark. Five ground water samples displayed concentrations of trichloroethene that exceeded its benchmark (Ref. 10, p. 41).

Analytical data from ground water samples collected from 1989 through 1993 were not included in this documentation record because appropriate background samples were not available for comparison purposes; however, these ground water samples do provide evidence of contamination by trichloroethene and tetrachloroethene in ground water.

### **Release Wells and Samples**

A discussion of release wells and samples collected during the investigations at the Fruit Avenue Plume site is presented below. Both background and release ground water samples collected from the investigations discussed below were not filtered (Ref. 42, p. 1). Further, the release samples are compared to the appropriate background sample based on date sampled and depth of screened interval. Therefore, the extent of the ground water plume has been defined by ground water samples meeting observed release criteria. Well locations are depicted on Figure A-3 of Attachment A.

Trichloroethene and tetrachloroethene are not naturally occurring or ubiquitous substances as evidenced by the fact that these substances were not detected in background samples collected upgradient or cross-gradient of the plume, but were detected in the release wells.

NMED performed a comprehensive ground water sampling event in 1996 within the downtown

Albuquerque area. Field activities included the sampling of 23 ground water monitoring wells in the downtown area. This investigation was conducted in an effort to assess the current ground water conditions of the area prior to performing a Background Investigation (Ref. 4, pp. 1, 9; Ref. 5, pp. 2-51).

**TABLE III  
NMED SAMPLES AND CONCENTRATIONS  
DECEMBER 1996**

**SANTA FE**

| SAMPLE LOCATION        | DM-8I   | DM-2I   | DM-3I   | DM-12I   | DM-13I  | MW-6I   |
|------------------------|---|---|---|--|---|---|
| TYPE OF WELL           | BKGND   | MNTR  | MNTR  | MNTR   | MNTR  | MNTR  |
| SAMPLE ID              | FW878   | FW889DL   | FW890   | FW506DL  | FW900DL   | FW886DL   |
| DATE SAMPLED           | 12/09/96  | 12/11/96  | 12/11/96  | 12/17/96   | 12/16/96  | 12/11/96  |
| TOTAL DEPTH (FT)       | 103   | 95  | 98  | 105  | 95  | 88  |
| SCREENED INTERVAL (FT) | 70-103  | 65-95   | 67.5-97.5   | 94.7-104.7   | 65-95   | 73-83   |
| Hazardous Substance    | Concentration (µg/L) (SQL)  |   |   |  |   |   |
| Trichloroethene        | 0.5 J (1)   | 42 (1)  | 24 (1)  | 42 (1)   | 58 (1)  | 32 (1)  |
| References             | Ref. 4 p. 69; Ref. 5, p. 10; Ref. 22, pp. 1-4, 7, 26; Ref. 42, p.2. | Ref. 4, p. 69; Ref. 5, p. 26; Ref. 22, pp. 1-5, 52; Ref. 42, p.2. | Ref. 4, p. 69; Ref. 5, p. 27; Ref. 22, pp. 1-5, 54; Ref. 42, p.2. | Ref. 4, p. 69; Ref. 5, p. 49; Ref. 23, pp. 1-7, 9, 20; Ref. 42, p.2. | Ref. 4, p. 71; Ref. 5, p. 40; Ref. 23, pp. 1-8, 22; Ref. 42, p.2. | Ref. 4, p. 69; Ref. 5, p. 23; Ref. 22, pp. 1-5, 42; Ref. 42, p.2. |

Notes:

DM Dames and Moore  
BKGND. Background well.  
MNTR. Monitoring well.

NMED performed a Background Investigation, in two phases, from September 1997 through August 1998. Objectives of the Background Investigation were to evaluate additional potential sources of contamination and delineate the estimated extent of the ground water plume (Ref. 4, p. 1). The first phase of the investigation was conducted from September through November 1997 and included the installation of six soil borings, installation and sampling of 19 monitoring wells (MW-8 through MW-26), and sampling of 49 existing monitoring wells. The Coca Cola Bottling Plant commercial well was also sampled (Ref. 4, p. 1). Two ground water samples displayed concentrations of tetrachloroethene that exceeded its MCL. Sixteen ground water samples displayed concentrations of trichloroethene that exceeded its MCL.

The second phase of the investigation was conducted from April through August 1998 and included sampling of 2 private supply wells, installation and sampling of 11 monitoring wells (MW-27 through MW-37), and sampling of 16 existing monitoring wells. The newly installed monitoring wells are screened continuously. The Saint Joseph Hospital private supply well was also sampled (Ref. 4, p. 2). Three ground water samples displayed concentrations of trichloroethene that exceeded its MCL.

**TABLE IV  
NMED SAMPLES AND CONCENTRATIONS  
SEPTEMBER 1997 THROUGH MAY 1998**

**ALLUVIUM**

| <b>SAMPLE LOCATION</b>        | <b>MW-11S</b>   | <b>DM-4S</b>  | <b>DM-5S</b>   |
|-------------------------------|---|---|--|
| <b>TYPE OF WELL</b>           | <b>BKGND.</b>   | <b>MNTR.</b>  | <b>MNTR.</b>   |
| <b>SAMPLE ID</b>              | <b>FQ888</b>  | <b>FQ877</b>  | <b>FQ813</b>   |
| <b>DATE SAMPLED</b>           | <b>11/13/97</b>   | <b>11/12/97</b>   | <b>11/18/97</b>  |
| <b>TOTAL DEPTH (FT)</b>       | <b>40.3</b>   | <b>49</b>   | <b>48</b>  |
| <b>SCREENED INTERVAL (FT)</b> | <b>25-40</b>  | <b>29-49</b>  | <b>33-48</b>   |
| <b>Hazardous Substance</b>    | <b>Concentration (µg/L) (SQL)</b>                                   |   |  |
| <b>Tetrachloroethene</b>      | <b>ND (1)</b>   | <b>15 (1)</b>   | <b>10 (1)</b>  |
| <b>References</b>             | Ref. 4, p. 70; Ref. 5, p. 275; Ref. 12, pp. 1-16, 21; Ref. 42, p.2. | Ref. 4, p. 69; Ref. 5, p. 270; Ref. 12, pp. 1-16, 19, 31; Ref. 42, p.2. | Ref. 4, p. 69; Ref. 5, p. 283; Ref. 24, pp. 1-9, 11, 14; Ref. 42, p.2. |

**Notes:**

BKGND. Background well.

MNTR. Monitoring well.

## SANTA FE

| SAMPLE LOCATION        | MW-9I   | DM-2I   | DM-3I  | DM-12I   | DM-13I  | MW-6I  |
|------------------------|---|---|--|--|---|--|
| TYPE OF WELL           | BKGND.  | MNTR.   | MNTR.  | MNTR.  | MNTR.   | MNTR.  |
| SAMPLE ID              | FQ867   | FQ894DL   | FQ893  | FQ892DL  | FQ879   | FQ886DL  |
| DATE SAMPLED           | 11/06/97  | 11/17/97  | 11/17/97   | 11/13/97   | 11/12/97  | 11/12/97   |
| TOTAL DEPTH (FT)       | 77.8  | 95  | 98   | 98   | 95  | 88   |
| SCREENED INTERVAL (FT) | 67.6-77.6   | 65-95   | 67.5-97.5  | 67-97  | 65-95   | 73-83  |
| Hazardous Substance    | Concentration (µg/L) (SQL)  |   |  |  |   |  |
| Trichloroethene        | 0.8 J (1)   | 47 (1)  | 20 (1)   | 57 (1)   | 76 (1)  | 34 (1)   |
| References             | Ref. 4, p. 70;<br>Ref. 5, p. 266;<br>Ref. 14, pp. 1-6, 9, 19; Ref. 42, p.2. | Ref. 4, p. 69;<br>Ref. 5, p. 278;<br>Ref. 24, pp. 1-10, 16; Ref. 42, p.2. | Ref. 4, p. 69;<br>Ref. 5, p. 278; Ref. 24, pp. 1-10, 15; Ref. 42, p.2. | Ref. 4, p. 69;<br>Ref. 5, p. 277;<br>Ref. 12, pp. 1-6, 21, 65; Ref. 42, p.2. | Ref. 4, p. 69;<br>Ref. 5, p. 271;<br>Ref. 12, pp. 1-10, 16, 19, 35; Ref. 42, p.2. | Ref. 4, p. 70;<br>Ref. 5, p. 273; Ref. 12, pp. 1-16, 20, 53; Ref. 42, p.2. |

## Notes:

BKGND. Background well.

MNTR. Monitoring well.

## SANTA FE (continued)

| SAMPLE LOCATION        | MW-9I   | MW-18I  | MW-25I   | MW-26I  | MW-27I  | MW-28I   |
|------------------------|---|---|--|---|---|--|
| TYPE OF WELL           | BKGND.  | MNTR.   | MNTR.  | MNTR.   | MNTR.   | MNTR.  |
| SAMPLE ID              | FQ867   | FQ873   | FQ862DL  | FQ861   | FEF66DL   | FEF67DL  |
| DATE SAMPLED           | 11/06/97  | 11/06/97  | 11/05/97   | 11/05/97  | 07/30/98  | 07/30/98   |
| TOTAL DEPTH (FT)       | 77.8  | 85  | 85.2   | 105   | 103.9   | 105  |
| SCREENED INTERVAL (FT) | 67.6-77.6   | 74.8-84.8   | 74.9-84.9  | 94.8-104.8  | 93.7-103.7  | 94.7-104.7   |
| Hazardous Substance    | Concentration (µg/L) (SQL)  |   |  |   |   |  |
| Trichloroethene        | 0.8 J (1)   | 18 (1)  | 54 (1)   | 22 (1)  | 46 (1)  | 21 (1)   |
| References             | Ref. 4, p. 70;<br>Ref. 5, p. 266;<br>Ref. 14, pp. 1-6, 9, 19; Ref. 42, p.2. | Ref. 4, p. 70;<br>Ref. 5, p. 268;<br>Ref. 14, pp. 1-6, 9, 33; Ref. 42, p.2. | Ref. 4, p. 71; Ref. 5, p. 263; Ref. 26, pp. 1-6, 12, 16, 18; Ref. 42, p.2. | Ref. 4, p. 71;<br>Ref. 5, p. 262;<br>Ref. 26, pp. 1-6, 9, 12, 16; Ref. 42, p.2. | Ref. 4, p. 69;<br>Ref. 5, p. 278;<br>Ref. 24, pp. 1-10, 16; Ref. 42, p.2. | Ref. 4, p. 69;<br>Ref. 5, p. 278; Ref. 24, pp. 1-10, 15; Ref. 42, p.2. |

## Notes:

BKGND. Background well.

MNTR. Monitoring well.

## SANTA FE

| SAMPLE LOCATION        | MW-14D  | DURANES #1                      | MW-22D   | MW-23D   |
|------------------------|---|---------------------------------|--|--|
| TYPE OF WELL           | BKGND.  | BKGND.                          | MONITOR  | MONITOR  |
| SAMPLE ID              | FQ887   | -----                           | FQ848  | FQ852DL  |
| DATE SAMPLED           | 11/13/97  | 08/04/98                        | 11/04/97   | 11/04/97   |
| TOTAL DEPTH (FT)       | 166.3   | 964                             | 192.4  | 240.2  |
| SCREENED INTERVAL (FT) | 156-166   | 204-964                         | 181.9-191.9  | 229.7-239.7  |
| Hazardous Substance    | Concentration (µg/L) (SQL)  |                                 |  |  |
| Trichloroethene        | ND (1)  | ND (0.5)                        | 11 (1)   | 35 (1)   |
| References             | Ref. 4, p. 70; Ref. 5, p. 274; Ref. 12, pp. 1-16, 21, 55; Ref. 42, p.2. | Ref. 41, pp. 2-6; Ref. 42, p.2. | Ref. 4, p. 70; Ref. 5, p. 256; Ref. 25, pp. 1-6; Ref. 42, p.2. | Ref. 4, p. 70; Ref. 5, p. 256; Ref. 25, pp. 1-6; Ref. 42, p.2. |

## Notes:

BKGND. Background well.

MNTR. Monitoring well.

## SANTA FE (continued)

| SAMPLE LOCATION        | MW-14D  | DURANES #1                      | CCBP (330')  | CCBP (455')   | SJH (266')  | SJH (290')  |
|------------------------|---|---------------------------------|--|---|---|---|
| TYPE OF WELL           | BKGND.  | BKGND.                          | MNTR.  | MNTR.   | CLOSED  | CLOSED  |
| SAMPLE ID              | FQ887   | -----                           | FW819  | FW820   | FR839   | FR842   |
| DATE SAMPLED           | 11/13/97  | 08/04/98                        | 08/11/97   | 08/11/97  | 05/12/98  | 05/12/98  |
| TOTAL DEPTH (FT)       | 166.3   | 964                             | 581*   | 581*  | 438†  | 438†  |
| SCREENED INTERVAL (FT) | 156-166   | 204-964                         | 310-350  | 445-465   | 260-270   | 280-300   |
| Hazardous Substance    | Concentration (µg/L) (SQL)  |                                 |  |   |   |   |
| Trichloroethene        | ND (1)  | ND (0.5)                        | 11 (1)   | 11 (1)  | 10 (1)  | 10 (1)  |
| References             | Ref. 4, p. 70; Ref. 5, p. 274; Ref. 12, pp. 1-16, 21, 55; Ref. 42, p.2. | Ref. 41, pp. 2-6; Ref. 42, p.2. | Ref. 4, p. 46; Ref. 5, p. 89; Ref. 12, pp. 1-16, 19, 31; Ref. 42, p.2. | Ref. 4, p. 46; Ref. 5, p. 89; Ref. 24, pp. 1-9, 11, 14; Ref. 42, p.2. | Ref. 4, p.46; Ref. 5, p. 314; Ref. 12, pp. 1-6, 21, 65; Ref. 42, p.2. | Ref. 4, p. 46; Ref. 5, p. 316; Ref. 12, pp. 1-16, 19, 35; Ref. 42, p.2. |

## Notes:

BKGND. Background well.

MNTR. Monitoring well.

CCBP Coca Cola Bottling Plant (commercial well)

SJH Saint Joseph Hospital

\* The Coca Cola Bottling Plant well is screened at five different intervals: 220-240; 260-295; 310-350; 445-465; and 545-555 (Ref. 4, p. 46).

† The Saint Joseph Hospital well is screened at four different intervals: 260-270; 280-300; 334-354; and 410-420 (Ref. 4, p. 46).

The Saint Joseph's Hospital well has been sampled by the CAEHD and NMED on a somewhat regular basis due to the ground water contamination in the area. Trichloroethene and tetrachloroethene concentrations in the Saint Joseph's Hospital well have been slowly approaching the health-based benchmarks (MCLs). The hospital ceased use of this well in January 1997 because of the presence of contamination by trichloroethene and is presently being supplied drinking water by the City of Albuquerque (Ref. 30, p. 1).

Under some circumstances a single well, over time, may provide both background and release samples. For example, where a regular water quality monitoring program is in effect, a time series of monitoring data may document encroachment of a hazardous substance plume (Ref. 11, p. 74). Thus, the Saint Joseph's Hospital well will be used as its own background well and data from a sufficient period of record is presented to show that a trend in increasing concentrations has been demonstrated.

Samples OR-90-1937 and OR-93-2954 will be designated as the background samples and show that the concentration of trichloroethene was not detected in 1990 and below the SQL in 1993 (Ref. 21, pp. 1-5, 78-80). The concentration of trichloroethene has been steadily increasing with time as evidenced by the additional nine samples presented in the tables below. These nine samples will be considered observed release samples for this well. Thus, an observed release will be established for this well when the sample measurement equals or exceeds the sample quantitation limit (Ref. 1, Sec. 2.3, Table 2-3). Three of the concentrations of trichloroethene are greater than three times the highest background concentration (3 µg/L, 2.8 µg/L, and 4.2 µg/L).

**TABLE V**  
**SAINT JOSEPH'S HOSPITAL SAMPLES AND CONCENTRATIONS**  
**SEPTEMBER 1990 THROUGH DECEMBER 1996**

| TYPE OF WELL<br>SAMPLE ID<br>DATE SAMPLED<br>TOTAL DEPTH (FT) | BKGND<br>OR-90-1937<br>09/06/90<br>438† | BKGND<br>OR-93-2954<br>11/18/93<br>438† | RELEASE<br>OR-93-3175<br>12/08/93<br>438† | RELEASE<br>OR-94-2437<br>07/28/94<br>438† | RELEASE<br>OR-94-3307<br>10/13/94<br>438† | RELEASE<br>OR-95-2433<br>05/17/95<br>438† |
|---|---|---|---|---|---|---|
| Hazardous Substance   | Concentration (µg/L) (SQL)              |   |   |   |   |   |
| Trichloroethene   | ND (1)                                  | 0.9 (1) <sup>1</sup>                    | 1 (1) <sup>1</sup>                        | 1 (0.5) <sup>2</sup>                      | 1.2 (0.5) <sup>1</sup>                    | 1.8 (0.5) <sup>2</sup>                    |
| References  | Ref. 21, PP. 78-80; Ref. 42, p.2.       | Ref. 4, p. 46; Ref. 21, pp. 1-5         | Ref. 4, p. 46; Ref. 21, pp. 6-10          | Ref. 4, p. 46; Ref. 21, pp. 11-23         | Ref. 4, p. 46; Ref. 21, pp. 24-39         | Ref. 4, p. 46; Ref. 21, pp. 40-52         |

Notes:

ND Not Detected.

† The Saint Joseph Hospital well is screened at four different intervals: 260-270; 280-300; 334-354; and 410-420 (Ref. 4, p. 46).

BKGND Background well.

**TABLE V (continued)**  
**SAINT JOSEPH'S HOSPITAL SAMPLES AND CONCENTRATIONS**

| TYPE OF WELL<br>SAMPLE ID<br>DATE SAMPLED<br>TOTAL DEPTH (FT) | RELEASE<br>OR-95-2808<br>06/08/95<br>438†       | RELEASE<br>OR-95-4519<br>11/05/95<br>438†        | RELEASE<br>OR-96-1084<br>03/18/96<br>438†        | RELEASE<br>OR-96-1953<br>06/14/96<br>438†        | RELEASE<br>OR-96-3711<br>12/17/96<br>438†        |
|---|---|--|--|--|--|
| Hazardous Substance   | Concentration (SQL) (µg/L)                      |  |  |  |  |
| Trichloroethene   | 2 (0.5) <sup>2</sup>                            | 3 (0.5) <sup>1</sup>                             | 2.8 (0.5) <sup>1</sup>                           | 2.4 (0.5) <sup>1</sup>                           | 4.2 (0.5) <sup>1</sup>                           |
| References  | Ref. 4, p. 46; Ref. 21, p. 53-65; Ref. 42, p.2. | Ref. 4, p. 46; Ref. 21, pp. 68-69; Ref. 42, p.2. | Ref. 4, p. 46; Ref. 21, pp. 70-72; Ref. 42, p.2. | Ref. 4, p. 46; Ref. 21, pp. 73-74; Ref. 42, p.2. | Ref. 4, p. 46; Ref. 21, pp. 75-77; Ref. 42, p.2. |

Notes:

- 1 MDLs were used for comparison purposes as these samples were not analyzed through the EPA CLP Program.  
2 PQLs were used for comparison purposes as these samples were not analyzed through the EPA CLP Program.  
† The Saint Joseph Hospital well is screened at four different intervals: 260-270; 280-300; 334-354; and 410-420 (Ref. 4, p. 46).

### Level I Samples

Level I concentrations are established in samples from drinking water wells in which the concentration of a hazardous substance that meets the criteria for an observed release is at or above its drinking water benchmark (Ref. 1, Subsecs. 2.5.1 and 2.5.2). Drinking water benchmarks, as set forth in the June 1996 edition of the *Superfund Chemical Data Matrix* (SCDM), include MCLs and/or screening concentrations for cancer risk (Ref. 2). As such, Level I concentrations have not been documented for the Fruit Avenue Plume Site in accordance with the HRS Rule (Ref. 1, Subsecs. 2.5.1 and 2.5.2; Ref. 2). Concentrations of trichloroethene above the benchmark were detected in the Saint Joseph's Hospital well when it was sampled in 1998; however, the well had already been closed at this time. Therefore, the Saint Joseph's Hospital well will be evaluated as a Level II well.

### Level II Samples

Level II concentrations are established in samples from drinking water wells in which the concentration of a hazardous substance that meets the criteria for an observed release is less than its drinking water benchmark (Ref. 1, Subsecs. 2.5.1 and 2.5.2). Drinking water benchmarks, as set forth in the June 1996 edition of SCDM, include MCLs and/or screening concentrations for cancer risk (Ref. 2). As such, Level II concentrations have been documented for the Saint Joseph's Hospital well in accordance with the HRS Rule (Ref. 1, Subsecs. 2.5.1 and 2.5.2; Ref. 2).

The Saint Joseph's Hospital well is a private supply well completed at a depth of 438 feet bgs within the Santa Fe Group Aquifer (Ref. 4, p. 46). The Saint Joseph's Hospital private supply well was utilized for

all water purposes at the hospital, including drinking water for all staff, employees, and patients (Ref. 30, p. 1). Trace concentrations of trichloroethene, tetrachloroethene, and cis-1,2-dichloroethene have been detected in this well beginning in November 1993 (Ref. 21, pp. 1-65).

The Saint Joseph's Hospital well has been sampled by the CAEHD and NMED on a somewhat regular basis from November 1993 through 1998. Over this period, the concentrations of trichloroethene have slowly been approaching the health-based benchmark (MCL). The hospital well was closed in January 1997 because of the presence of contamination by trichloroethene (Ref. 30, p. 1). The Saint Joseph's Hospital well is depicted on Figure A-3 of Attachment A.

#### LEVEL II SAMPLES

| WELL ID/<br>SAMPLE ID | DATE<br>SAMPLED | HAZARDOUS<br>SUBSTANCE | CONC.<br>(µg/L) | BENCHMARK<br>CONC.<br>(µg/L) <sup>1</sup> | BENCHMARK | REFS.               |
|-----------------------|-----------------|------------------------|-----------------|---|-----------|---------------------|
| SJH/<br>OR-96-3711    | 12/17/96        | Trichloroethene        | 4.2             | 5   | MCL       | Ref. 2; Ref. 21, p. |

#### Notes:

- 1 Value assigned using the Superfund Chemical Data Matrix (Ref. 2).  
 SJH Saint Joseph's Hospital.  
 MCL Maximum Contaminant Level.

#### Attribution

At this time, insufficient information is available to document attribution of hazardous substances from a particular potential source(s) to the contaminated ground water plume. NMED performed a Background Investigation in September 1997 through August 1998. Potential sources identified consisted of dry-cleaning facilities, UST sites, auto body repair shops, and a chemical warehouse (Ref. 4, pp. 8, 10). Available records and information concerning the facilities were evaluated with respect to solvent/chemical usage and disposal practices, past and present, that would aid in the release of hazardous substances. Further, various subsurface soil samples and ground water samples were collected during the various investigations performed in an attempt to characterize soil and ground water conditions at each potential source (Ref. 4, pp. 12-15).

The large number of potential sources makes source identification difficult. Further, adequate information to attribute hazardous substances from these potential sources directly to the ground water plume is not available. Per HRS Rule, Section 3.1.1, when the source itself consists of a ground water plume with no identified source(s), no separate attribution is required (Ref. 1, Sec. 3.1.1).

## **Hazardous Substances Released**

The hazardous substances that meet the criteria for an observed release are trichloroethene and tetrachloroethene (Refer to Subsec. 3.1.1 of this documentation record). A ground water release factor value of 550 has been assigned based on documented observed releases of both trichloroethene and tetrachloroethene.

Ground Water Observed Release Factor Value: 550

### **3.1.2 Potential to Release - NE**

According to the HRS Rule, potential to release is only evaluated if an observed release cannot be established for the aquifer of concern (Ref. 1, Subsec. 3.1.2). As such, the potential to release section for the ground water pathway was not evaluated because an observed release has been documented at the Fruit Avenue Plume Site (See Subsec. 3.1.1 of this documentation record).

## **3.2 WASTE CHARACTERISTICS**

### **3.2.1 Toxicity/Mobility**

For each hazardous substance, a toxicity factor value, a mobility factor value, and a combined toxicity/mobility factor value is assigned per HRS Rule, Section 3.2.1 (Ref. 1, Sec. 3.2.1).

#### **3.2.1.1 Toxicity**

According to the HRS Rule, toxicity is evaluated for hazardous substances at the site that are available to the pathway being scored. As such, toxicity trichloroethene and tetrachloroethene will be evaluated. According to the June 1996 edition of SCDM, trichloroethene has a toxicity value of 10 and tetrachloroethene has a toxicity value of 100 (Ref. 2).

#### **3.2.1.2 Mobility**

According to the HRS Rule, for any hazardous substance that meets the criteria for an observed release by chemical analysis to one or more aquifers underlying the source(s) at the site, regardless of the aquifer being evaluated, assign a mobility factor value of 1 (Ref. 1, Subsec. 3.2.1.1).

From these two values, a combined toxicity/mobility factor value is assigned for the aquifer being evaluated based on Table 3-9 of the HRS Rule (Ref. 1, Subsec. 3.2.1.3). For the purposes of this documentation record, the toxicity value for tetrachloroethene will be used to calculate the toxicity/mobility factor value for the aquifer since it has the higher toxicity value.

**TOXICITY/MOBILITY**

| HAZARDOUS SUBSTANCE | TOXICITY FACTOR VALUE <sup>1</sup> | MOBILITY FACTOR VALUE <sup>2</sup> | TOXICITY/MOBILITY | REFERENCES |
|---------------------|------------------------------------|------------------------------------|-------------------|------------|
| Trichloroethene     | 10                                 | 1                                  | 10                | Ref. 2     |
| Tetrachloroethene   | 100                                | 1                                  | 100               | Ref. 2     |

Notes:

<sup>1</sup> Value assigned using the Superfund Chemical Data Matrix (Ref. 2).

<sup>2</sup> A mobility factor value of 1 is assigned since trichloroethene and tetrachloroethene meet the criteria for an observed release to ground water.

Toxicity/Mobility Factor Value: 100

**3.2.2 Hazardous Waste Quantity**

According to the HRS Rule for all pathways except soil exposure, if the source hazardous waste factor value cannot be determined and is known to be greater than 0, and if Level I and/or Level II targets are present for the pathway being evaluated; then a value of 100 is assigned as the hazardous waste quantity for that pathway (Ref. 1, Subsec. 2.4.2.2). As such, a pathway hazardous waste quantity factor value of 100 is assigned.

Pathway Hazardous Waste Quantity Factor Value: 100

**3.2.3 Waste Characteristics Factor Category Value**

According to the HRS Rule, the waste characteristics factor category value is derived by multiplying the toxicity/mobility factor value by the hazardous waste quantity factor value (Ref. 1, Subsec. 3.2.3). Based on this value, a value is assigned from Table 2-7 of the HRS Rule (Ref. 1, Subsec. 2.4.3.1). According to Table 2-7, a product of  $1 \times 10^4$  equates to waste characteristics factor category value of 10 (Ref. 1, Subsec. 3.2.3).

Toxicity/Mobility Factor Value (100) x Hazardous Waste Quantity Factor Value (100):  $1 \times 10^4$

Ground Water Pathway Waste Characteristics Factor Category Value: 10

**3.3 TARGETS**

The Santa Fe Group Aquifer (alluvium and Santa Fe Group combined) is the principle source of ground water for industrial, commercial, agricultural, and potable use in the Albuquerque area (Ref. 17, p. 53; Ref. 18, p. 3). Target wells consist of private supply wells and municipal supply wells located within the TDL of a 4-mile radius from the estimated center of the plume and are presented in the following table. Target

municipal supply well locations within each distance radii are depicted on the City of Albuquerque water system map included in Reference 38. The SJH and UNM#7 wells are depicted on Figure A-3. It should be noted that the boundary of the ground water plume was defined by the ground water samples meeting observed release criteria and the distance radii from the source were measured from the approximate center of the defined extent of the plume (Ref. 3, p. 1).

### TARGET WELLS

| WELL ID      | DISTANCE<br>CATEGORY (miles) | LEVEL I<br>CONTAMINATION<br>(Y/N) | LEVEL II<br>CONTAMINATION<br>(Y/N) | POTENTIAL<br>CONTAMINATION<br>(Y/N) |
|--------------|------------------------------|-----------------------------------|------------------------------------|-------------------------------------|
| SJH          | 0 - 1/4                      | No                                | Yes                                | No                                  |
| UNM#7        | 1 - 2                        | No                                | No                                 | Yes                                 |
| Yale 1       | 1 - 2                        | No                                | No                                 | Yes                                 |
| Yale 2       | 1 - 2                        | No                                | No                                 | Yes                                 |
| Yale 3       | 1 - 2                        | No                                | No                                 | Yes                                 |
| San Jose 2   | 1 - 2                        | No                                | No                                 | Yes                                 |
| San Jose 3   | 1 - 2                        | No                                | No                                 | Yes                                 |
| Duranes #1   | 1 - 2                        | No                                | No                                 | Yes                                 |
| Candelaria 1 | 2 - 3                        | No                                | No                                 | Yes                                 |
| Candelaria 2 | 2 - 3                        | No                                | No                                 | Yes                                 |
| Candelaria 3 | 2 - 3                        | No                                | No                                 | Yes                                 |
| Candelaria 4 | 2 - 3                        | No                                | No                                 | Yes                                 |
| Duranes 2    | 2 - 3                        | No                                | No                                 | Yes                                 |
| Duranes 3    | 2 - 3                        | No                                | No                                 | Yes                                 |
| Duranes 4    | 2 - 3                        | No                                | No                                 | Yes                                 |
| Duranes 5    | 2 - 3                        | No                                | No                                 | Yes                                 |
| Duranes 6    | 2 - 3                        | No                                | No                                 | Yes                                 |
| Duranes 7    | 2 - 3                        | No                                | No                                 | Yes                                 |
| Atrisco 1    | 2 - 3                        | No                                | No                                 | Yes                                 |
| Atrisco 2    | 2 - 3                        | No                                | No                                 | Yes                                 |
| Atrisco 3    | 2 - 3                        | No                                | No                                 | Yes                                 |
| Atrisco 4    | 2 - 3                        | No                                | No                                 | Yes                                 |
| San Jose 1   | 2 - 3                        | No                                | No                                 | Yes                                 |

**TARGET WELLS (Continued)**

| <b>WELL ID</b>  | <b>DISTANCE<br/>CATEGORY (miles)</b> | <b>LEVEL I<br/>CONTAMINATION<br/>(Y/N)</b> | <b>LEVEL II<br/>CONTAMINATION<br/>(Y/N)</b> | <b>POTENTIAL<br/>CONTAMINATION<br/>(Y/N)</b> |
|-----------------|--------------------------------------|--|---|--|
| San Jose 4      | 2 - 3                                | No   | No  | Yes  |
| San Jose 5      | 2 - 3                                | No   | No  | Yes  |
| Miles 1         | 2 - 3                                | No   | No  | Yes  |
| Burton 1        | 2 - 3                                | No   | No  | Yes  |
| Burton 2        | 2 - 3                                | No   | No  | Yes  |
| Burton 3        | 2 - 3                                | No   | No  | Yes  |
| Burton 4        | 2 - 3                                | No   | No  | Yes  |
| Santa Barbara 1 | 2 - 3                                | No   | No  | Yes  |
| Griegos 1       | 3 - 4                                | No   | No  | Yes  |
| Griegos 2       | 3 - 4                                | No   | No  | Yes  |
| Griegos 3       | 3 - 4                                | No   | No  | Yes  |
| Griegos 4       | 3 - 4                                | No   | No  | Yes  |
| Griegos 5       | 3 - 4                                | No   | No  | Yes  |
| Charles 5       | 3 - 4                                | No   | No  | Yes  |
| Volandia 3      | 3 - 4                                | No   | No  | Yes  |

Note:

The boundary of the plume was defined by ground water samples meeting observed release criteria. The distance radii were measured from the approximate center of the defined extent of the plume.

**3.3.1      Nearest Well**

According to the HRS Rule, if one or more drinking water wells is subject to Level II concentrations, a value of 45 is assigned (Ref. 1, Subsec. 3.3.1). The Saint Joseph Hospital private supply well is subject to Level II concentrations and is completed within the Santa Fe Group Aquifer at a total depth of 438 feet bgs (Ref. 4, p. 46). Therefore, a nearest well factor value of 45 has been assigned.

Nearest Well Factor Value: 45

**3.3.2      Population**

The population subject to Level I and/or Level II concentrations is summarized in the tables presented below.

**3.3.2.1 Level of Contamination**

For a discussion of ground water samples displaying Level I and/or Level II concentrations, refer to pages 31 and 32 of this documentation record.

**3.3.2.2 Level I Concentrations**

A Level I population has not been identified for the Fruit Avenue Plume Site.

**3.3.2.3 Level II Concentrations**

Presented in the table below are drinking water samples that have trichloroethene levels that meet the criteria for Level II concentrations and are at least three times or more above the designated background levels for trichloroethene. The Level II well location is depicted on Figure A-3 of Attachment A.

**LEVEL II POPULATION**

| <b>WELL ID/SAMPLE ID</b> | <b>POPULATION</b> | <b>REFERENCES</b> |
|--------------------------|-------------------|-------------------|
| SJH                      | 1,741             | Ref. 36, p. 1     |

The Saint Joseph Hospital well is a private supply well that provided drinking water to employees, staff, and patients at the hospital. The water supplied by this well was also used in food preparation for the hospital (Ref. 30, p. 1). There are approximately 1,741 employees and staff at the hospital. Additionally, the hospital has approximately 338 patient beds (Ref. 36, p. 1). However, since the patient beds may not be occupied full-time, they were not used to evaluate the population associated with Level II contamination.

According to the HRS Rule, the Level II Concentrations Factor Value was determined by identifying any wells subject to Level II concentrations for the aquifer being evaluated and summing the number of people served by wells subject to Level II concentrations. This sum is the Level II Concentrations Factor Value (Ref. 1, Subsec. 3.3.2.3).

Population Served by Level II Wells: 1,741 = 1,741

Level II Concentrations Factor Value: 1,741

### 3.3.2.4 Potential Contamination

Potential contamination will be evaluated based on the potential for nearby private supply wells and municipal supply wells to be exposed to site-related contamination. Most households and businesses within the city limits of Albuquerque are served by the City of Albuquerque municipal water system (Ref. 4, p. 17). The City of Albuquerque municipal water supply is basically divided into two blended systems: one east of the Rio Grande River and one west of the Rio Grande River. The City of Albuquerque municipal water system typically does not pump water across the river. Each system (east and west) is a blended system and no one municipal supply well contributes more than 40 percent of the total water supplied to the system (Ref. 4, p. 18). According to the City of Albuquerque Water Utility Division, there are 36 municipal supply wells and 1 private supply well located within a 4-mile radius of the Fruit Avenue Ground Water Plume site (Ref. 38, pp. 2-5). Approximately 32 municipal supply wells are located east of the Rio Grande and 4 municipal supply wells are located west of the Rio Grande (Ref. 38, p. 5).

The City of Albuquerque municipal supply wells are completed within the Santa Fe Group Aquifer. The Santa Fe Group Aquifer is the sole source of water for drinking, agricultural, commercial, and industrial purposes for the City of Albuquerque and contamination by trichloroethene and tetrachloroethene has been identified in the aquifer. The boundary of the ground water plume was defined by ground water samples from 1997 through 1998 meeting observed release criteria. The distance of each radii was measured from the approximate center of the defined extent of the ground water plume.

The City of Albuquerque utilizes a total of 88 municipal supply wells to supply water to the City of Albuquerque. The total number of individuals served by these 88 wells is approximately 413,432 individuals (Ref. 38, pp. 2-4). Approximately 338,716 individuals are served by wells located east of the Rio Grande River and approximately 74,716 individuals are served by wells located west of the Rio Grande River (Ref. 38, pp. 2-4). Therefore, to determine the number of individuals served by each well in the system, the total number of individuals served by the system is divided by the total number of wells within the system. Thus, approximately 4,704 individuals are served by each well in the east system and approximately 4,670 individuals are served by each well in the west system (Ref. 38, pp. 2-4). The distance weighted population values based on these calculations for those municipal supply or private supply wells located within a 4-mile radius of the approximate center of the ground water plume are presented in the following table.

Additionally, the University of New Mexico #7 well (UNM#7) is a private supply well serving the University of New Mexico. In the past, the University's water system consisted of two wells. Use of one well has ceased and the remaining well (UNM#7) supplies drinking water to employees, staff, and students, which is approximately 30,000 individuals served. The 30,000 individuals associated with the UNM#7 well will be included in the population subject to potential contamination. The UNM#7 well is located within the 1 to 2 mile distance ring southeast of the approximate center of the plume. The UNM#7 well is depicted on Figure A-3 of Attachment A.

All municipal supply wells considered subject to potential contamination and the 4-mile distance radii are depicted on the City of Albuquerque Water Utility Division map included in Reference 38.

| DISTANCE CATEGORY (miles) | NUMBER OF WELLS                              | POPULATION SERVED x NUMBER OF WELLS  | DISTANCE WEIGHTED POPULATION VALUE | REFERENCES                           |
|---------------------------|--|--|------------------------------------|--------------------------------------|
| 0 - ¼                     | 0  | 0  | 0                                  | Ref. 1, Table 3-12; Ref. 38, pp. 2-5 |
| ¼ - ½                     | 0  | 0  | 0                                  | Ref. 1, Table 3-12; Ref. 38, pp. 2-5 |
| ½ - 1                     | 0  | 0  | 0                                  | Ref. 1, Table 3-12; Ref. 38, pp. 2-5 |
| 1 - 2                     | 6 municipal (east)<br>1 private              | 4,704 x 6 = 28,224<br>30,000 x 1 = 30,000<br>Total Served: 58,224              | 9,385                              | Ref. 1, Table 3-12; Ref. 38, pp. 2-5 |
| 2 - 3                     | 23 municipal (19 east side)<br>(4 west side) | East: 4,704 x 19 = 89,376<br>West: 4,670 x 4 = 18,680<br>Total Served: 108,056 | 21,222                             | Ref. 1, Table 3-12; Ref. 38, pp. 2-5 |
| 3 - 4                     | 7 municipal (east)                           | 4,704 x 7 = 32,928   | 4,171                              | Ref. 1, Table 3-12; Ref. 38, pp. 2-5 |

For each calculated population in a specific distance category, a distance weighted population value is assigned from Table 3-12 of the HRS Rule for the "other than karst" aquifer category. The sum of the distance weighted population values is divided by 10 and rounded to the nearest integer to determine the Potential Contamination Factor Value (Ref. 1, Subsec. 3.3.2.4).

Sum of Distance Weighted Population Values: 34,778  
Potential Contamination Factor Value: 3,478

### 3.3.3 Resources

No resources have been identified for the Fruit Avenue Plume Site.

Resources Factor Value: 0

### 3.3.4 Wellhead Protection Area

A Wellhead Protection Area (WHPA) is defined as the surface and subsurface area surrounding a ground water well or well field, supplying a public water system, through which contaminants are reasonably likely to move toward and reach such water well or well field (Ref. 40, p. 4).

In New Mexico, the designated WHPA around all municipal supply wells is a radius of 1,000 feet (Ref. 40, p. 6). There are 29 municipal supply wells located within a 4-mile radius of the ground water plume; however, the estimated extent of the ground water plume does not lie within a WHPA. As such, a Wellhead Protection Area Factor Value of 5 has been assigned as there are WHPAs associated with the aquifer being evaluated (Santa Fe Group) within the target distance limit (Ref. 1, Sec. 3.3.4).

Wellhead Protection Area Factor Value: 5

Wellhead Protection Factor Value: 5

**3.4 GROUND WATER MIGRATION SCORE FOR AN AQUIFER**

The ground water migration score for the aquifer (Santa Fe Group) being evaluated was calculated as follows:

$$\begin{aligned}\text{Aquifer Score} &= \text{Likelihood of Release} \times \text{Waste Characteristics} \times \text{Targets}/82,500 \\ &= 550 \times 10 \times 5,269/82,500 \\ &= 351.3\end{aligned}$$

According to the HRS Rule, the ground water migration score for an aquifer is subject to a maximum value of 100. As such, a value of 100 will be assigned as the ground water migration score for an aquifer (Ref. 1, Sec. 3.4).

**3.5 CALCULATION OF GROUND WATER MIGRATION PATHWAY SCORE**

A value of 100 is assigned as the ground water migration pathway score since only one aquifer (Santa Fe Group) was evaluated for this site. As such, the ground water migration score for an aquifer will be assigned as the ground water migration pathway score (Ref. 1, Sec. 3.5).

Ground Water Migration Pathway Score: 100

**4.0 SURFACE WATER MIGRATION PATHWAY - NOT SCORED**

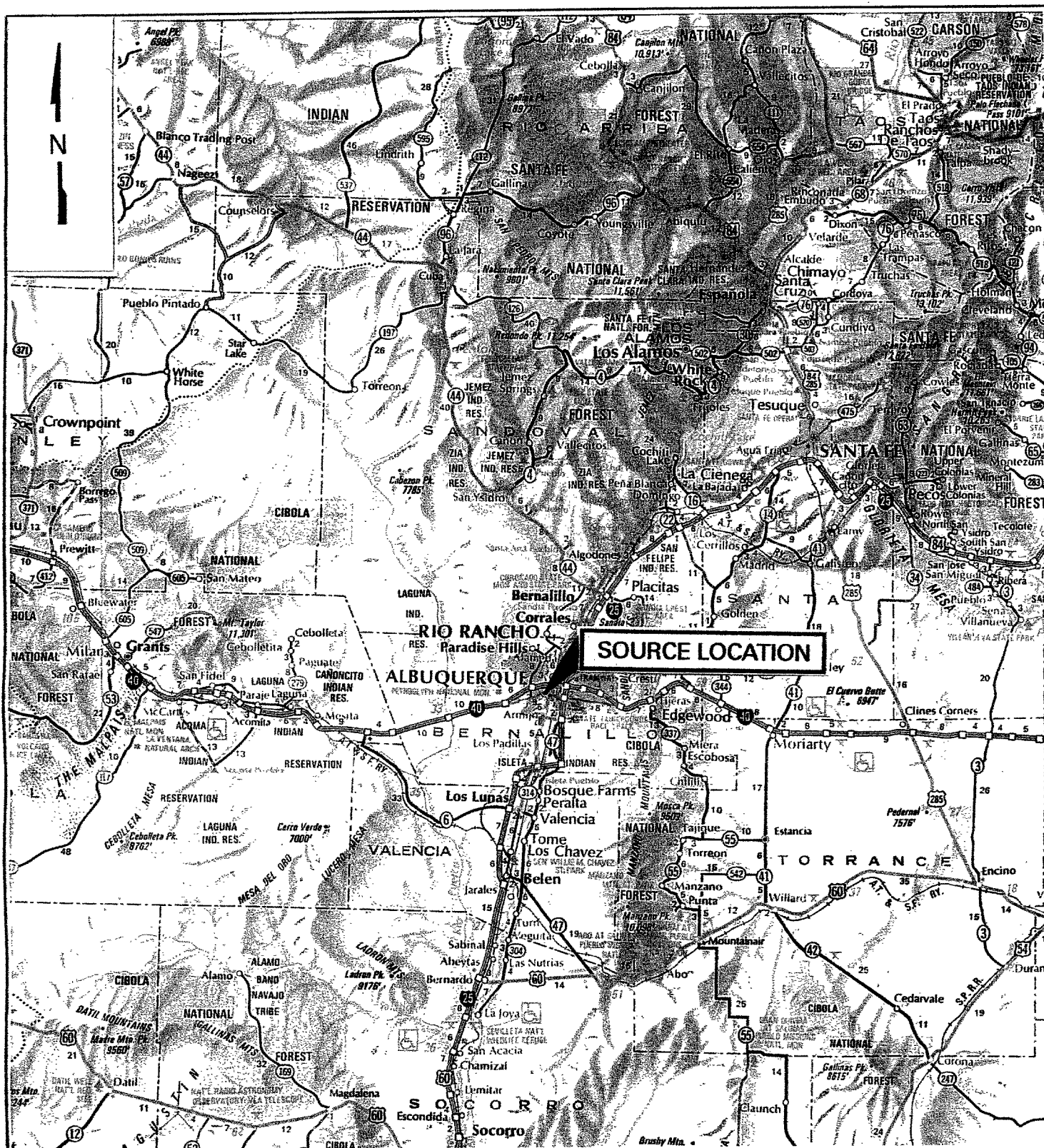
The surface water pathway has not been scored because there is no overland segment or flood potential for the site and an observed release to surface water has not been established.

**5.0 SOIL EXPOSURE PATHWAY - NOT SCORED**

No contaminated soil associated with the ground water plume have been identified. No residences, schools, or daycare centers have been identified on or within 200 feet of any known or potential source of trichloroethene or tetrachloroethene contamination. Based on the available information, evaluation of this pathway would not significantly affect the overall site score.

**6.0      AIR PATHWAY - NOT SCORED**

An observed release to the air migration pathway has not been documented because there is not analytical evidence to support a release. Based on available information, evaluation of the air migration pathway would not significantly affect the overall site score.



MAP PREPARED FROM:  
U.S. DEPT. OF THE INTERIOR  
GEOGRAPHICAL SURVEY

ALBUQUERQUE WEST QUADRANGLE  
NEW MEXICO  
7.5 MINUTE SERIES (TOPOGRAPHIC)  
1990 SERIES

0 11.5 23  
SCALE IN MILES

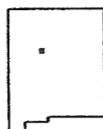
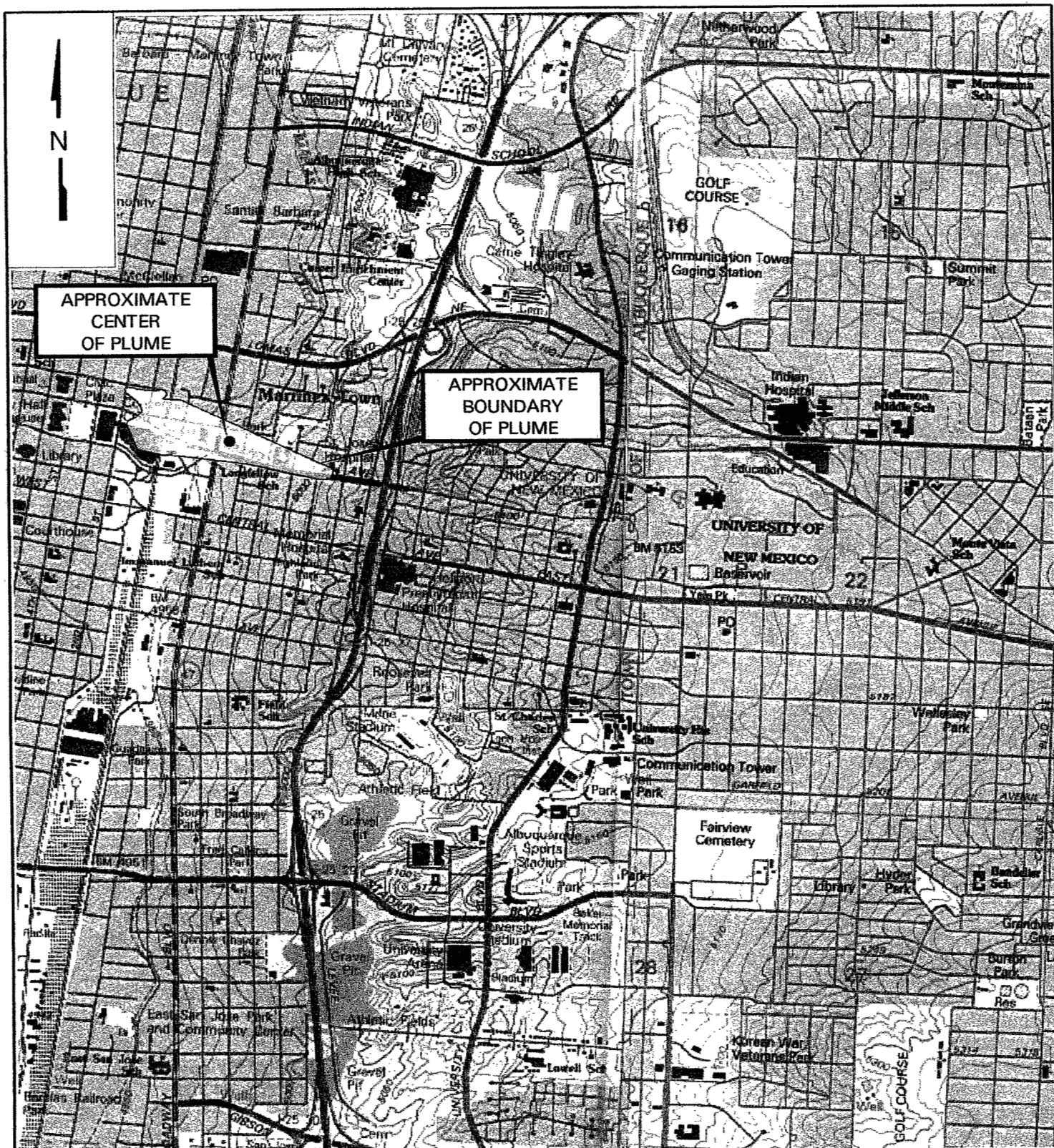
**WESTON**  
ANALYTICAL SERVICES

**FIGURE A-1**  
**SOURCE LOCATION MAP**  
**FRUIT AVENUE PLUME**  
**ALBUQUERQUE, NEW MEXICO**  
**CERCLA ID. NO.: NMD98668911**

**EPA REGION 6**  
**HRS DOCUMENTATION RECORD**

**W.O. NO.: 03886-190-006-0200**

weston\etk\card\albuq-a1.s 05-25-99



MAP PREPARED FROM:  
U.S. GEOLOGICAL SURVEY  
7.5 MINUTES SERIES

ALBUQUERQUE WEST  
NEW MEXICO  
1990

0 1000 2000  
SCALE IN FEET

**WESTON**  
ENGINEERS DESIGNERS CONSULTANTS

**FIGURE A-2**  
**SOURCE AREA MAP**  
**FRUIT AVENUE PLUME**  
ALBUQUERQUE, NEW MEXICO  
CERCLA ID. NO.: NMD986668911

EPA REGION 6  
HRS DOCUMENTATION RECORD

W.O. NO.: 03886-190-006-0200



## ATTACHMENT B DATA QUALITY ASSESSMENT

Ground water samples were collected between 1989 and 1998 by the City of Albuquerque Environmental Health Department (CAEHD), the New Mexico Environment Department (NMED), or a private contractor. Analytical data are available from the following investigations conducted at the Fruit Avenue Plume Site:

- (1) 1989 Compliance Sampling,
- (2) 1990 Screening Site Inspection (SSI),
- (3) 1993 Expanded Site Inspection (ESI),
- (4) 1993 Phase II Environmental Site Assessment,
- (5) 1993 - 1995 Compliance Sampling,
- (6) 1996 Comprehensive Ground Water Sampling, and
- (7) 1997 - 1998 Background Investigation.

Ground water samples from these investigations were submitted either to the New Mexico Scientific Laboratory Division (SLD), a Contract Laboratory Program (CLP) laboratory designated by the U.S. Environmental Protection Agency (USEPA), or Hall Environmental Analysis Laboratory.

Analytical data used to score the Fruit Avenue Plume Site met the Data Quality Objectives (DQOs) for data of known and documented quality. Critical quality assurance/quality control (QA/QC) elements performed by each laboratory in accordance with EPA-approved analytical methods included, but were not limited to, the following (Refs. 6, 10, 12-14, 19-29, 34-35):

- Method Blanks
- Matrix Spike/Matrix Spike Duplicates (MS/MSD)
- Spike Recovery
- Duplicates
- Internal Standards
- Laboratory Control Samples

Analytical data used for this documentation record were validated for useability by a qualified chemist and/or data validation team (Refs. 6, 10, 12-14, 19-29, 35-35). Analytical data presented in this documentation record were found to be of known and documented quality and useable for HRS purposes.

### New Mexico Scientific Laboratory Division (SLD)

The SLD analyzed the ground water samples from the 1989 Compliance Sampling, 1990 SSI, and the 1995 Compliance Sampling. These samples were analyzed using EPA Methods 601 and 602 (Ref. 6, pp. 8, 11; Ref. 21). Confirmation analyses were performed on all positively identified compounds by gas chromatography/mass spectrometry (GC/MS) (Ref. 6, pp. 8, 11). The SLD is able to produce data of known quality. QA/QC summaries for samples analyzed by SLD are included as References 6 and 21.

### EPA Designated Contract Laboratory Program (CLP) Laboratories

Ground water samples from the 1993 ESI, 1996 Comprehensive Ground Water Sampling Event, and the 1997 through 1998 Background Investigation were submitted to EPA-designated CLP laboratories. The CLP consists of private laboratories that are under contract to provide analytical services to the EPA. To participate in this program, laboratories must meet stringent requirements. Standards are established for personnel, equipment, laboratory practices, and the quality control operations. The main objective of the CLP is to provide data of known and documented quality to aid in the support of the EPA's actions. Ground water samples were analyzed for Target Compound List (TCL) Volatile Organics in accordance with EPA-approved methods. QA/QC summary forms, result summaries, and chain of custody forms for samples analyzed by a CLP laboratory are included in References 12, 13, 14, 20, 22, 23, 24, 25, 26, 27, 28, and 29.

### Hall Environmental Analysis Laboratory

Ground water samples from the 1993 Phase II Environmental Site Assessment were submitted to Hall Environmental Analysis Laboratory. The samples were analyzed using EPA Methods 601 and 602 (Ref. 10). The Hall Environmental Analysis data was determined to be useable and of known quality. Chain of custody forms and result summaries for samples analyzed by Hall Environmental Analysis Laboratory are included in Reference 10.